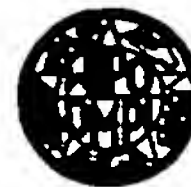


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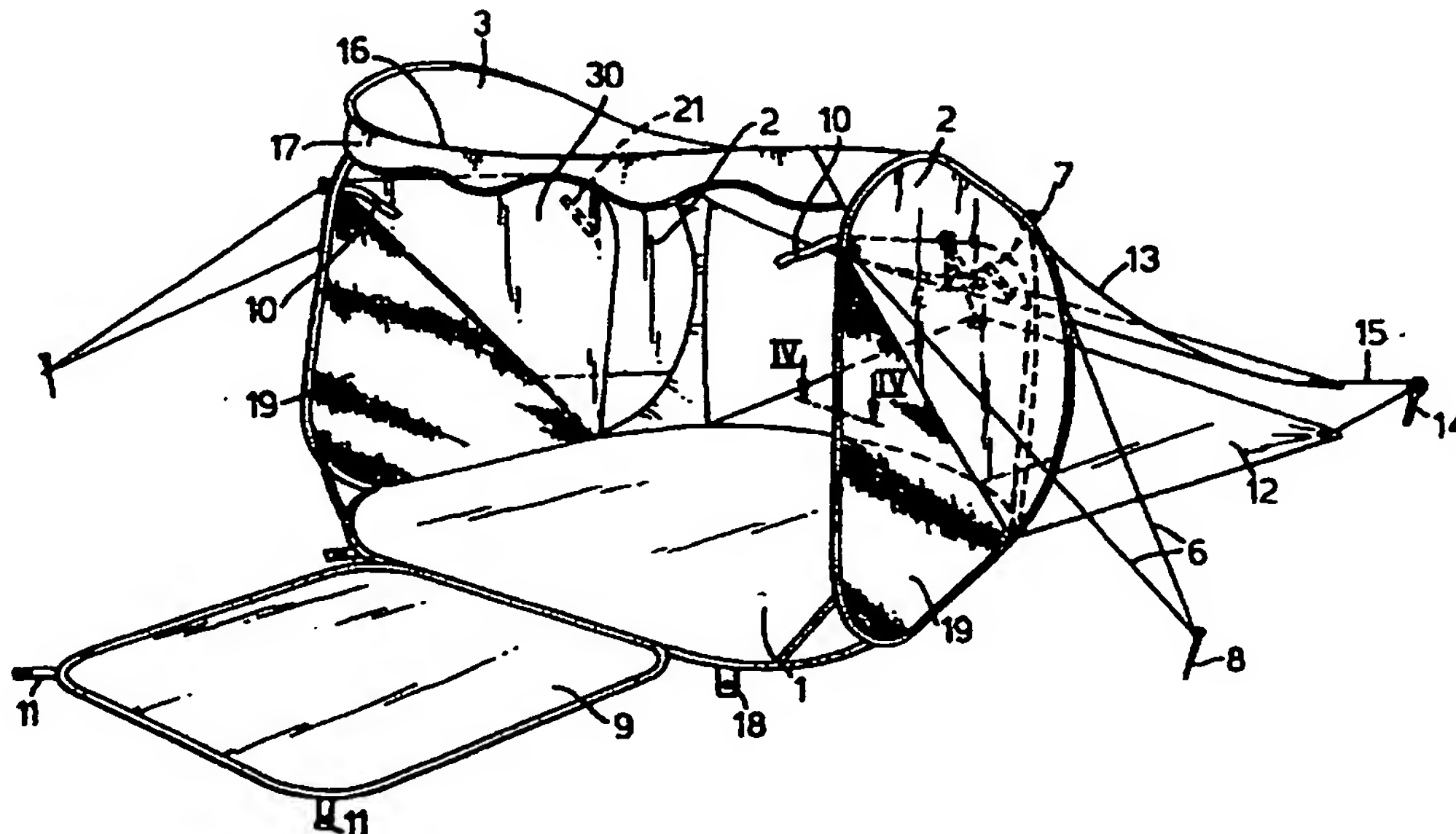
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(54) Title: SUNSHADE DEVICE



(57) Abstract

A sunshade device consists of base, side and top wall panels (1, 2, 3) each of which has a peripheral loop of resilient wire. The device can be collapsed by folding the four panels down on top of one another, and then twist-folding them into a small configuration.

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SUNSHADE DEVICE

The invention is concerned with sunshades which are typically used to protect holidaymakers at sunny resorts or to protect picnickers and fishermen from excessive exposure to the ultraviolet radiation in sunlight and also from elements such as wind and rain. Conventional sunshades are parasols in the form of a canopy which is stretched over a collapsible framework of pole and spokes in the manner of an umbrella. The bottom of the pole may be stuck into the ground or located in a socket in a heavy base to hold the parasol erect.

While such parasols are effective when the sun is overhead, they provide poor protection in the early morning or late afternoon when the sun is low in the sky but still intense. This problem cannot be alleviated by inclining the pole as the weight of the canopy would tend to cause damage. In some cases the upper part of the pole and the canopy can tilt relatively to the lower part of the pole and although this may inhibit collapse of the parasol, inadequate protection is generally provided when the sun is low in the sky. In any case, parasol canopies are usually circular and when the sun is overhead the shade afforded thereby is also circular, which is not ideal to shield one or more reclining elongate persons unless the canopy is very large.

In accordance with the present invention, a sunshade device comprises a series of first, second and third wall panels, which are connected together edge to edge in series with the remote edges of the first and third wall panels being connected by a fourth wall panel, the first and third wall panels being arranged, when the device is erected, to extend upwards as side wall panels from opposite edges of a base wall panel formed by the second wall panel, and the fourth wall panel forming a top wall panel which limits the separation of the upper edges of the side wall panels; at least a front of the device bounded by edges of the four

wall panels being open; and at least the first, second and third wall panels providing a plurality of twist-fold panels (as herein defined) which are of sufficiently similar size and shape that when folded down over one another they can be twist-folded together.

A person may sit or lie within the device while protected from excessive radiation or to some extent from the wind. If the device is made from waterproof material it may also be used to provide protection against rain, eg for use as a fishing shelter, although in that case it may need to have larger dimensions at the open front than when acting only as a sunshade, to allow for line casting.

The angle of the side wall panels to the vertical when the device is erected will be small, preferably within 15°, the actual angle being determined by the widths of the top and base wall panels and the height of the side wall panels. The substantially vertical side walls and the generally flat top wall panel gives the device a feeling of much greater internal roominess and airiness than do other differently constructed tent-like devices on the market.

In the present context a twist-fold panel is defined as being formed by a flexible sheet which is normally held taut in a spread position by a loop of spring wire which extends around the periphery of the sheet, the panel being collapsible by grasping the peripheral wire at spaced positions and twisting the wire in the same direction out of the plane of the loop, whereupon the wire folds into three smaller overlapping, almost coplanar loops. Subsequently, slight twisting of the smaller overlapping loops out of the overlapping configuration causes the panel to spring open to its spread position.

Although it could be round, the cross-section of the spring wire usually has a major dimension and a minor dimension, with the major dimension substantially perpendicular to the plane of the panel when in the spread position. The spring wire is preferably flat, but may have an oval or any other suitable cross-section. The wire may

be made of a resilient plastic material but will more usually be made of metal.

When the sunshade device is collapsed, the twist-fold panels are folded down overlapping one another, whereupon,
5 provided that the loops of wire have a sufficiently similar size, shape and relative disposition, the panels can be collapsed together by grasping and twisting the overlying wire loops simultaneously. The advantage of the construction is that, with the twist-fold panels collapsed,
10 the whole device may be carried in a small flat bag, but readily erected simply by starting to untwist the smaller overlapping wire loops.

The top wall panel may also be a twist-fold panel for simultaneous collapse with the other panels but, equally,
15 it could be a simple sheet of fabric.

In the simplest and most likely commercially successful construction, the side and the base wall panels provide respective ones of a series of three of the twist-fold panels.

20 Although the sizes and the shapes of the twist-fold panels provided by the side and base wall panels need not be exactly the same, they must be sufficiently similar to enable the simultaneous twist-folding. However, this provides a certain restriction in that in order to make the
25 device wide enough to accommodate persons comfortably and with adequate ventilation, when the width of the base wall panel corresponds to the width of a twist-fold panel, the width of the base wall panel has to be reflected in the height of the side wall panels, and this may make the
30 device undesirably high and hence subject to excessive wind pressure and excessively large when folded. This disadvantage can be overcome by forming the base wall panel as two or more similar twist-fold panels, connected together side by side and each having a size and shape
35 sufficiently similar to one another and to the other twist-fold panels that the device may be collapsed first by folding the side twist-fold panels down over the base

twist-fold panels, and then folding the base twist-fold panels over one another, prior to twist-folding all the panels simultaneously.

5 The rear end of the device could be open, partly closed or closed by a rear wall panel of flexible fabric and any of the side and rear wall panels may be perforate, e.g. made wholly or partly from netting or having openings for ventilation and to provide an open aspect. When for use, e.g. as a fishing shelter, fewer openings will be
10 needed and those which are may be provided with closure flaps held in place by e.g. velcro or sliding clasp fasteners. A rear wall panel may be longer than the height of the side wall panels at the rear and not, or only partly, connected to the rear edges thereof so as to be
15 capable of acting as a rearwardly and downwardly extending awning, eg to be pegged to the ground behind the rear edge of the base wall panel and provide, below its side edges, side openings for ventilation and openness which are open down to the level of the base wall panel. This awning will
20 provide extra sun protection and storage area. Irrespective of the awning, if the rear wall panel does not extend down to the ground, any sand can be tipped off the base wall panel, by lifting the front of the panel. To avoid exposure to the sun through a perforate portion in a side
25 wall panel, as the angle of the sun changes, and without having to move the device on the ground, the side wall panel may additionally be provided with an imperforate screen which is deployable over the perforate portion.

30 The base wall panel, effectively acts as a ground sheet and may be made of a waterproof material, such as a plastics fabric. It may also be provided with an integral additional ground sheet or sheets extending forwardly and/or rearwardly.

35 In order to prevent the side panels from falling over when the device is erect, at least one guy line may be connected to the upper part of each side wall panel, to extend outwards and downwards to a peg to be secured in the

ground. In addition at least one guy line may be connected to a mid portion of each side wall panel, also to extend outwards and downwards to a peg to be secured in the ground. This latter guy is particularly useful in preventing a side wall panel from buckling inwards when subjected to direct wind pressure. Additional peg or other ground fixings may be provided around the base of the device.

The base wall panel could provide two of the twist-fold panels connected together one in front of the other, the forward one of these two twist-fold panels providing the additional ground sheet. This ensures that the additional ground sheet is held taut without the need for ground pegs.

The peripheral loops of spring wire provided in the twist-fold panels of the side wall panels will preferably be more robust than that or those in the base wall panel, and this may also be so in the top wall panel when that also provides a twist-fold panel. This is because the base and in some cases top wall panels are required only for spacing purposes and the actual strength to hold the device erect is provided by the wire loops of the side wall panels. Using less robust wire in the base wall panel and, when applicable, the top wall panel reduces the weight of the device and facilitates the twist-folding.

A convenient shape is created for the device if the side and base wall panels are generally trapezoidal with increasing width from rear to front. Thus the height and width of the interior space will increase forwardly.

The front of the top wall panel may have a forwardly projecting peak, preferably with a convexly curved front peripheral edge. This is particularly important when the side wall panels are substantially trapezoidal as the top wall panel will be backwardly tilted and, in the absence of the peak, the base wall panel (disregarding any front additional ground sheet) would extend too far forward of

the front edge of the top wall panel and thereby deprive the user of necessary overhead protection.

5 The peak gives greater protection from solar radiation to people in or around the sunshade and/or enables the other panels to be smaller if desired whilst still providing good protection from solar radiation from above, giving a more open aspect from the side and saving in material and weight.

10 The peak may be formed as an integral part of a twist-fold provided by the top wall panel, to keep the material of the peak taut when in the spread position. The front of the top wall panel, at which the peak projects, is preferably the widest part of the top wall panel. Even though the twist-fold panel provided with the peak may be
15 larger than the other twist-fold panels by virtue of the peak, it is surprisingly found that the sunshade device can still be twist-folded into smaller overlapping loops for storage or carriage, although these overlapping loops may not overlie each other fully.

20 Alternatively the top wall panel, may have a peak provided by a further panel associated therewith, the further panel being deployable to project beyond the front of the top wall panel, and when not deployed, the top wall panel and further panel being collapsible with the other
25 panels of the sunshade device. The further panel, which may also be a twist-fold panel, may be connected to the top wall panel through a pivot about which the further panel is arranged to swivel to be positioned in either the deployed or a retracted position. Alternatively the further panel
30 may be hinged along one edge to the top wall panel to enable it to be swung forwards and backwards between the deployed and retracted positions, or in yet another example arranged to slide out from, for example, a pocket on the top wall panel to contain the further panel; or pockets in
35 the top wall panel to contain the ends of a wire or wires extending from the sides of the further panel. When the further panel is deployed to project beyond the front of

the top wall panel it is preferably secured in this position by means of, for example, clips, clamps, press studs, laces or fastening straps with velcro at least partially along their length.

5 Some examples of sunshade devices constructed in accordance with the present invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of the first device erected;

10 Fig. 2 is a side elevation of the first device erected;

Fig. 3 is a plan of the first device erected;

Fig. 4 is a section taken on the line IV-IV in Fig. 1;

15 Fig. 5 is a diagram showing the dimensions of the twist-fold panels of the first device;

Fig. 6 shows the first device when twist-folded;

Fig. 7 is a front elevation of a second device;

20 Fig. 8 is a diagram corresponding to Fig. 5 but showing the dimensions of the twist-fold panels of a third device;

Fig. 9 is a perspective view of a fourth device; and,

Fig. 10 is a diagram showing the dimensions of the twist-fold panels of the fourth device.

As particularly shown in Figs. 1 to 5, the device is
25 composed of a base wall panel 1, two side wall panels 2, and a top wall panel 3, all of which are twist-fold panels having a peripheral seam 4 containing a loop of springy wire 5 of elongate cross-section. The wall panels are made essentially of a tight woven lightweight nylon fabric which
30 is held substantially taut by the peripheral spring wire when the panels are unfolded. The base wall panel 1 is made of a material which is, or is treated to make it, waterproof and the outer faces of the top and optionally also the side wall panels, which may also be waterproof,
35 are provided with a silvery coating to provide reflection of solar radiation. The fabric at the adjacent edges of adjacent wall panels are either continuous or sewn together

to provide hinges about which the adjacent panels can rotate relatively to one another. Although this is necessary for folding the device down for transportation, some support is required to hold the device erect. This is provided in the illustrated examples by two guy lines 6, of thin cord, which are attached at respective fixings 7 at the edges of upper parts of respective ones of the side wall panels 2, and may be held taut by ground pegs 8. In addition there is shown in dotted lines in Figure 2 the provision of an additional fixing tab 7' below and between the fixings 7 for a further guy line 6'. Conveniently, a single cord is reeved from one fixing 7, through an aperture in the peg 8, up to the tab 7' and through an aperture therein, back to and through the aperture in the peg 8 and hence to the other fixing 7. In this way all the guy lines can easily be pulled taut simultaneously by pulling on the peg. In this erect position the width of the top wall panel 3 determines the separation of the upper parts of the side wall panels 2 and provided that the widths of the base and top wall panels 1 and 3 are substantially the same, the side wall panels 2 will be substantially upright.

In order to increase the size of the dry and clean area on which persons using the device may rest, there is hinged in similar fashion to the front edge of the base wall panel 1 a twist-fold additional ground sheet panel 9 which, because of its peripheral wire loop, which can be quite thin, tends to remain with its fabric panel stretched taut without the need for pegs. While the rest of the device is erected, the panel 9 can be swung up through 90°, as shown by the arrow in Fig. 2, and held there by ribbons 10, which are fixed to the side wall panels and can be passed through perforated tabs 11 at the edge of the panel 9 and tied. The interior of the device then gives a degree of privacy, e.g. for changing to or from beach clothes. An additional ground sheet panel 12 is attached to the rear edge of the base wall panel 1 and may be deployed

projecting rearwardly on the ground beneath an extension flap 13 forming an awning. This flap is attached to the rear edge of the top wall panel 3, and is deployed extending downwardly and rearwardly where, at each side, it is held, together with the ground sheet 12, as taut as necessary by ground pegs 14 and a cord 15. The cord is attached at one end to a corner of the ground sheet 12 and at the other end to a corner of the flap 13 and passes freely through a hole in the peg 14. The gap between the rear and side edges of the ground sheet 12 and of the flap 13 allows for ventilation. For extra protection, both the ground sheet 12 and awning 13 have an increasing width in the rearward direction.

The base and side wall panels 1 and 2 are generally trapezoidal in shape and are of the same size and shape with the dimensions and radii of curvature as shown in Fig. 5 down to the line 1,2. Consequently the internal width and height of the device increases from the rear to the front of the erect device, as is apparent from Figs. 1 to 3. The top wall panel 3 also has the same size and dimensions as the wall panels 1 and 2, except for a forwardly projecting curved peak 16 from which there hangs a pelmet 17. This peak extends the top wall panel forwardly by an additional 30 cms as shown in Fig. 5 down to the line 3.

Perforated tabs 18, to receive ground pegs, may also be provided at the bottom edges of the side wall panels for extra security against displacement by the wind.

A triangular netting window 19 is provided at the front bottom corners of each side wall panel 2, to allow for visibility and ventilation. However, if the breeze is excessive or if the sun has moved round so that it can shine through the netting undesirably, a provision is made to close these windows by providing within each side wall panel a screen in the form of a flap 20 of substantially impermeable material and of substantially the same size as the netting window. The flap is arranged either to be held

folded backwards and upwards inside the respective side wall panel and to be held there by a velcro or other fastening 21, or to be folded down to cover the window 19 and to be held also in this position by a similar fastening.

When it is time to fold the device for transportation, the pegs are released from the ground, the awning flap 13 and ground sheet 12 are pushed inwardly onto the base wall panel 1 and the ground sheet panel 9 is folded upwards and backwards through 180° so that it overlies the base wall panel 1. The side and top wall panels are then folded down sideways so that one side wall panel 2 is coplanar with the base wall panel 1 and underlies the top wall panel 3, with the other side wall panel 2 overlying the base wall panel 1. The top wall panel 3 and first side wall panel 2 are then folded upwards and sideways through 180° so that all five twist-fold panels then overlie the base wall panel 1. In spite of the fact that the top wall panel 3 and ground sheet panel 11 are of slightly different size and shape from the other three panels, the whole device can then be twist-folded so that the wire loops in all the twist-fold panels fall into three loops all overlying one another. In fact the illustrated device with the dimensions shown in Fig. 5 can be twist-folded into a generally circular package, as shown in Fig. 6, having a diameter of the order of 45 cms. This can readily be inserted into a bag, whereupon the device, weighing a total of about 1.9 kg can be easily carried. In order subsequently to re-erect the device, it is only necessary to displace the overlapping wire loops slightly from their twist-folded configuration, for all the panels to spring to an open position. The ground sheet panel 9 can then be unfolded, and the pegs deployed, to enable the device to be erected in a matter of seconds.

In a variation, which is not illustrated, one or both of the awning 13 and additional ground sheet 12 may be formed as a twist-fold panel, in which case the awning

panel and/or ground sheet panel would be swung upwards and inwards through 180°, respectively, over the top wall panel 3 and base wall panel 1, prior to twist-folding the device for transport.

5 Fig. 7 shows a modification in which the base, side and top wall panels are the same as in the first illustrated example. There are two differences. First, instead of the ground sheet 12 and extension flap 13, the device is provided with a rear wall panel 22, which is sewn
10 to the rear edges of the side and top wall panels 2, 3, leaving ventilation window openings 23 and 24 at the back of the device.

 The second difference is that instead of the twist-fold ground sheet 9, a simple waterproof sheet 25 is
15 connected at one edge to the front edge of the base wall panel 1, and arranged to be held deployed taut by ground pegs and perforated tabs 26 at its front corners if necessary in windy conditions.

 A third example, for use as a fisherman's shelter in
20 good or bad weather differs from the second example of Fig. 7 in that the window openings 23 and 24 are replaced, e.g. by a single central window opening which may be closed by a flap with releasable fastenings. Also, in order to provide a larger front opening the dimensions of the twist-
25 fold panels are as shown in Fig. 8, instead of as shown in Fig. 5.

 The fourth example, illustrated in Figs. 9 and 10, differs essentially from the previous examples in that the base wall panel is formed by two twist-fold panels 27, each
30 with the generally trapezoidal shape and with the dimensions, shown in Fig. 10. The two panels 27 are hinged together at the wider ones of their parallel sides. Twist-fold side wall panels 28 of similar size and shape to the panels 27, are hinged to respective ones of the panels 27
35 along the respective narrower ones of their parallel sides of the trapezium. A top wall panel 29 is connected to the upper edges of the side wall panels but is not itself a

twist-fold panel. The base wall panel is held by ground pegs 30 and as with the earlier examples, the side wall panels are held erect by guy lines 31 and pegs 32.

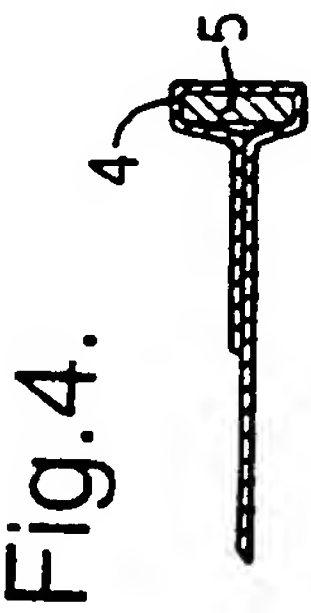
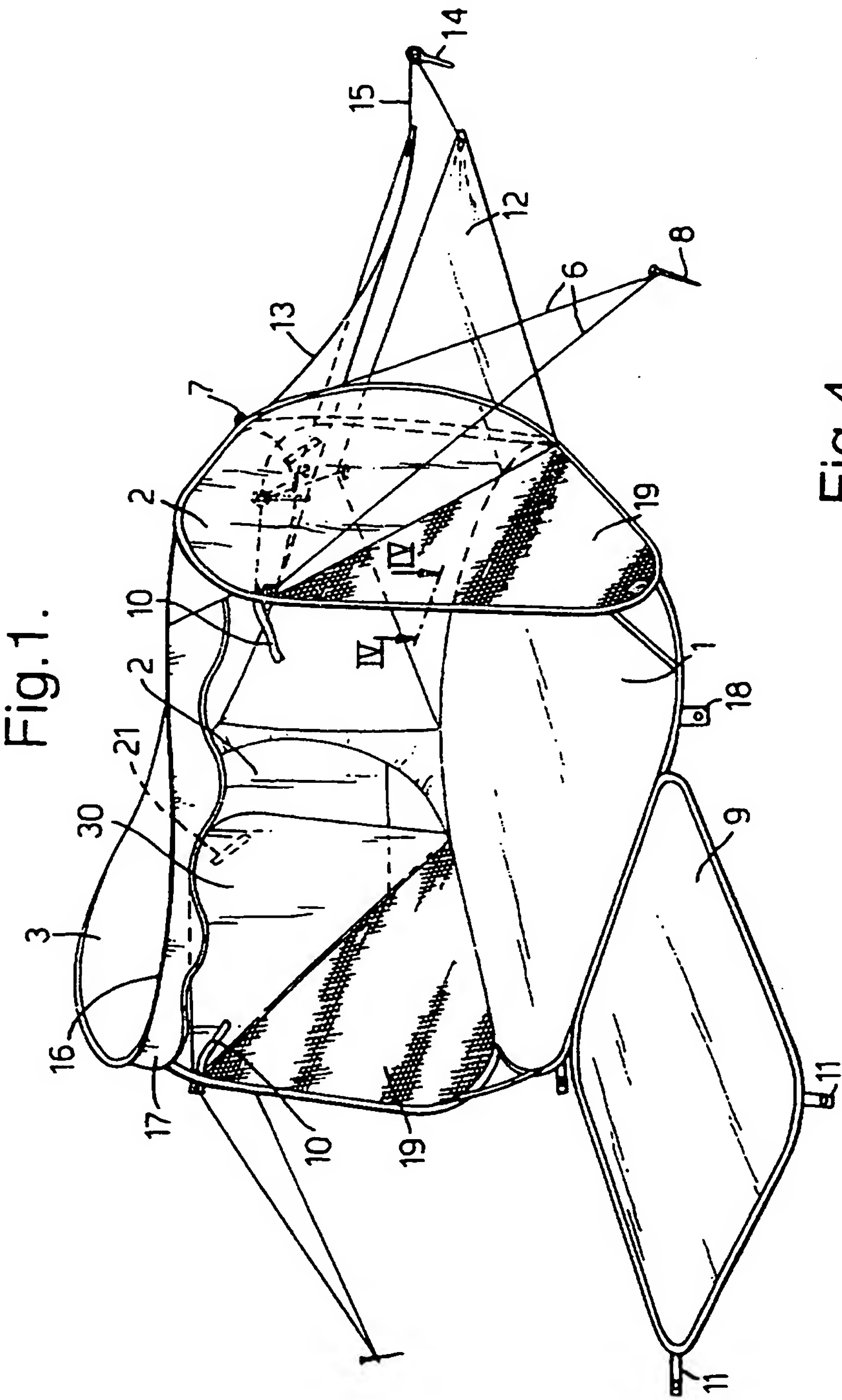
5 When it is desired to fold this device, with the pegs released, the side wall panels 28 are folded down onto respective ones of the panels 27, as shown by the arrows. As this happens the top wall panel 29 collapses between the other panels. One of the panels 27 and the overlying panel
10 28 is then folded through 180° so as to overlie the other panels 27 and 28, whereupon all four panels can be twist-folded into a smaller configuration similar to that shown in Fig. 6.

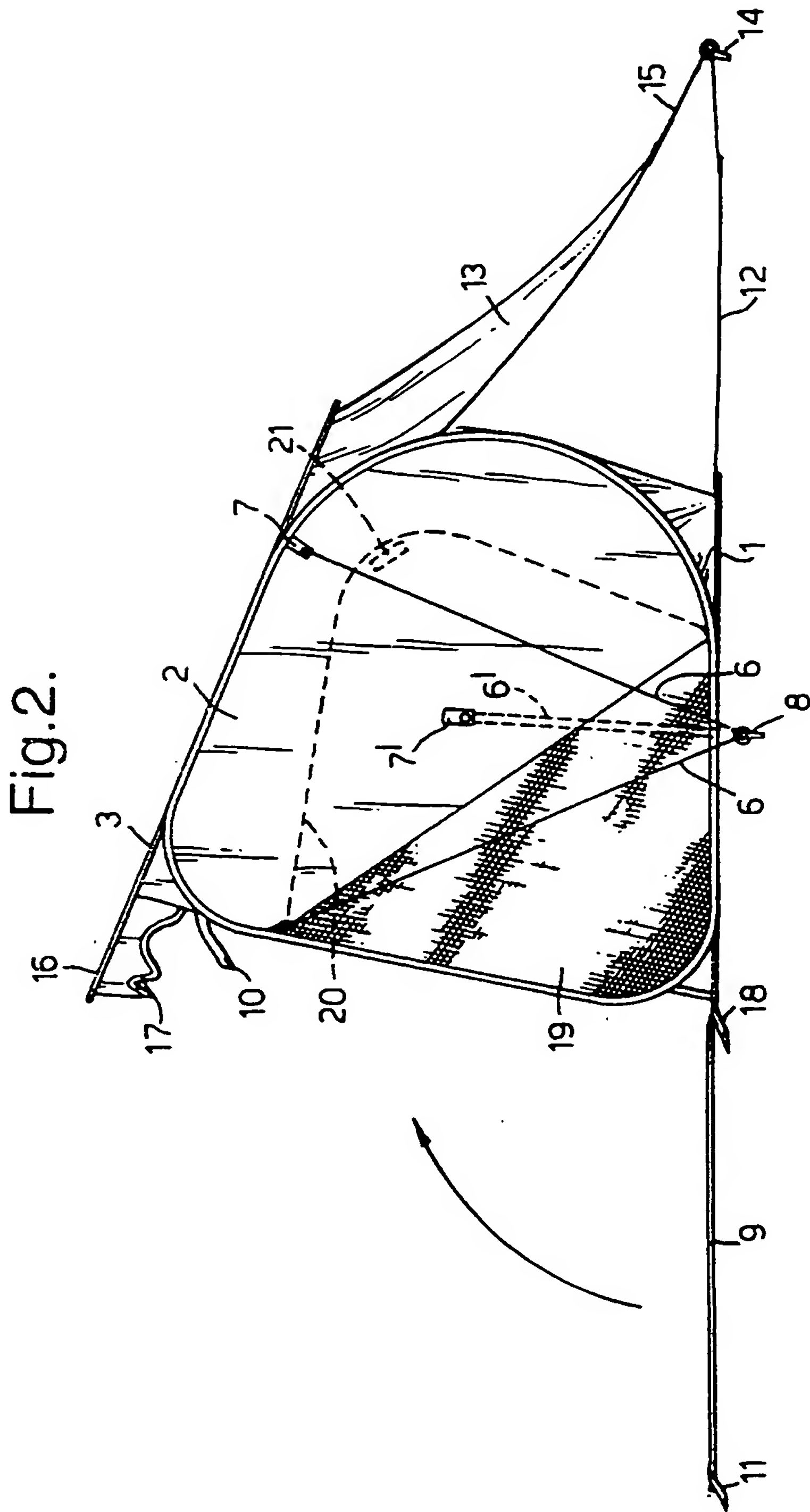
CLAIMS

1. A sun shade device comprising a series of first, second and third wall panels, which are connected together edge to edge in series with the remote edges of the first and third wall panels being connected by a fourth wall panel, the first and third wall panels being arranged, when the device is erected, to extend upwards as side wall panels from opposite edges of a base wall panel formed by the second wall panel, and the fourth wall panel forming a top wall panel which limits the separation of the upper edges of the side wall panels; at least a front of the device bounded by edges of the four wall panels being open; and at least the first, second and third wall panels providing a plurality of twist-fold panels (as herein defined) which are of sufficiently similar size and shape that when folded down over one another they can be twist-folded together.
2. A device according to claim 1, in which the base wall panel is provided with an integral additional ground sheet arranged to be deployed extending forwardly.
3. A device according to claim 1 or claim 2, in which the top wall panel also provides one of the twist fold panels.
4. A device according to claim 3, wherein the peripheral wire of the twist-fold panels provided by the side wall panels is more robust than that in the twist-fold panel provided by the top wall panel.
5. A device according to claim 2, or to claim 3 or claim 4, when dependant on claim 2, wherein the base wall panel provides two of the twist-fold panels connected together one in front of the other, the forward one of these two twist-fold panels providing the additional ground sheet.

6. A device according to claim 1 or claim 2, wherein the base wall panel provides two or more of the twist-fold panels connected together side by side between the side wall panels.
- 5
7. A device according to any one of claims 1 to 5, wherein the side and base wall panels provide respective ones of a series of three of the twist-fold panels.
- 10
8. A device according to claim 7, in which the base and side wall panels are generally trapezoidal in shape whereby the interior space of the device increases in height and width from rear to front.
- 15
9. A device according to any one of the preceding claims, in which the peripheral wires of the side wall panels are more robust than that in the twist-fold panel(s) of the base wall panel.
- 20
10. A device according to any one of the preceding claims, in which at least one guy line is provided attached to the upper part of each of the side wall panels for holding the side wall panels substantially upright.
- 25
11. A device according to any one of the preceding claims, in which at least one guy line is provided attached to a mid portion of each of the side wall panels for holding the side wall panels substantially upright.
- 30
12. A device according to any one of the preceding claims, in which a part of at least one of the side wall panels is formed as a perforate portion.
- 35
13. A device according to claim 12, wherein the respective side wall panel is provided with a substantially imperforate screen which is deployable over the perforate portion.

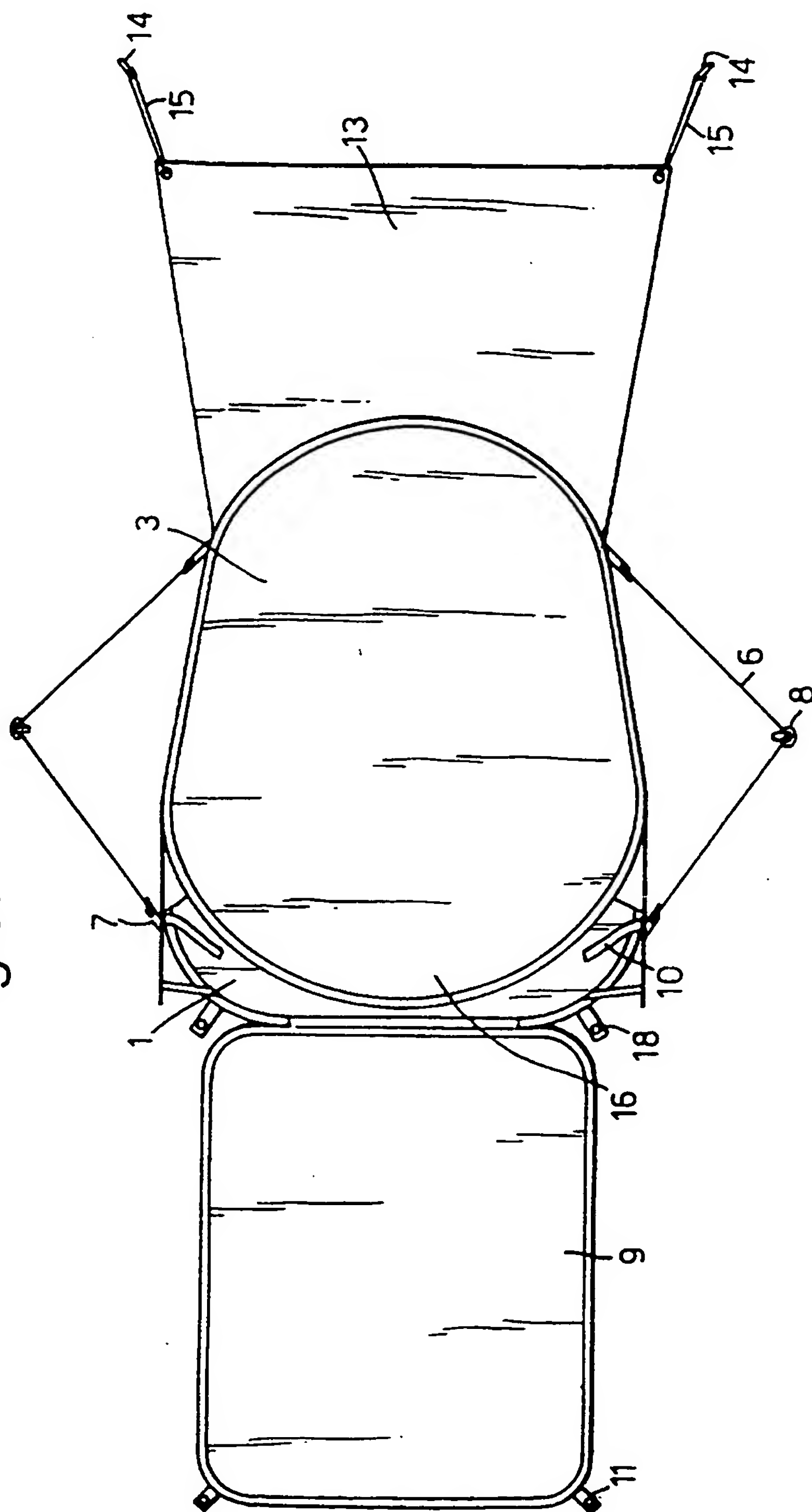
14. A device according to any one of the preceding claims, wherein the front of the top wall panel has a downwardly projecting pelmet.
- 5 15. A device according to any one of the preceding claims, wherein the front of the top wall panel has a forwardly projecting peak.
- 10 16. A device according to claim 15, when dependent at least on claim 3, wherein the peak is formed as an integral part of the twist-fold panel provided by the top wall panel.
- 15 17. A device according to claim 15 or claim 16, wherein the peak has a convexly curved front peripheral edge.
- 20 18. A device according to any one of the preceding claims, wherein at least one perforate portion is formed in the back of the device.
- 25 19. A device according to claim 18, wherein the back perforate portion, or at least one of the portions, opens down to a position substantially level with the base wall panel.
20. A device according to claim 18 or claim 19, which has an awning extending rearwardly and downwardly from at or adjacent to the rear of the top wall panel.
- 30 21. A device according to claim 20, wherein the width of the awning increases in the rearward direction.





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Fig.3.



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Fig.5.

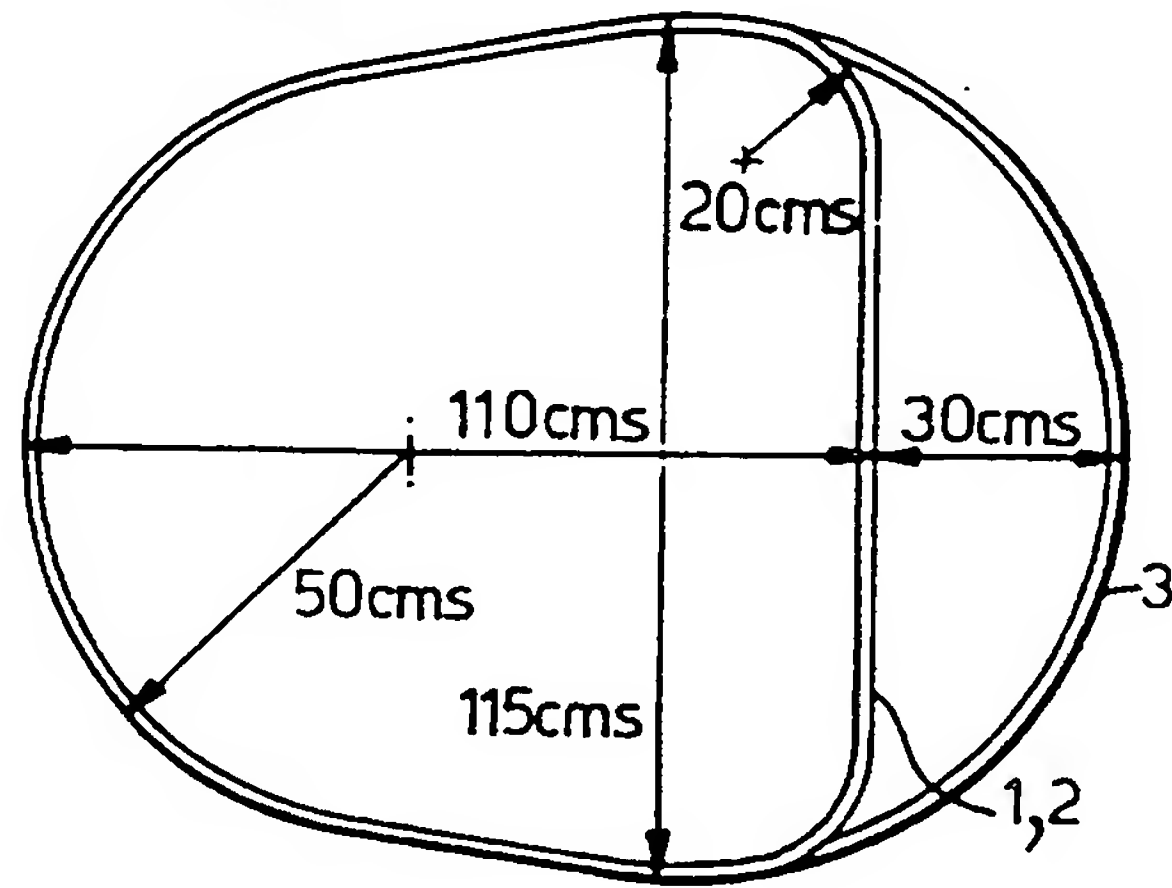


Fig.8.

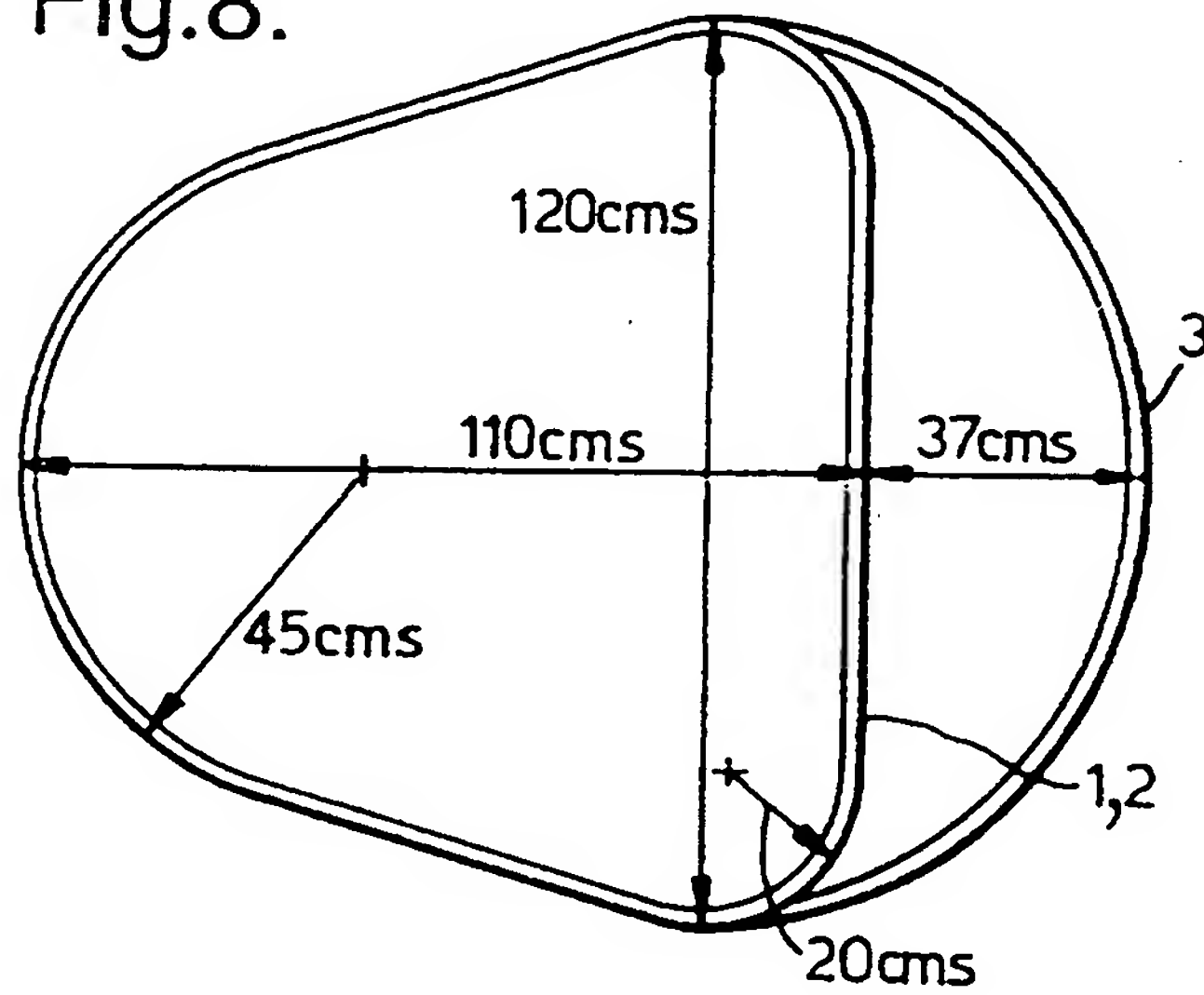


Fig.6.

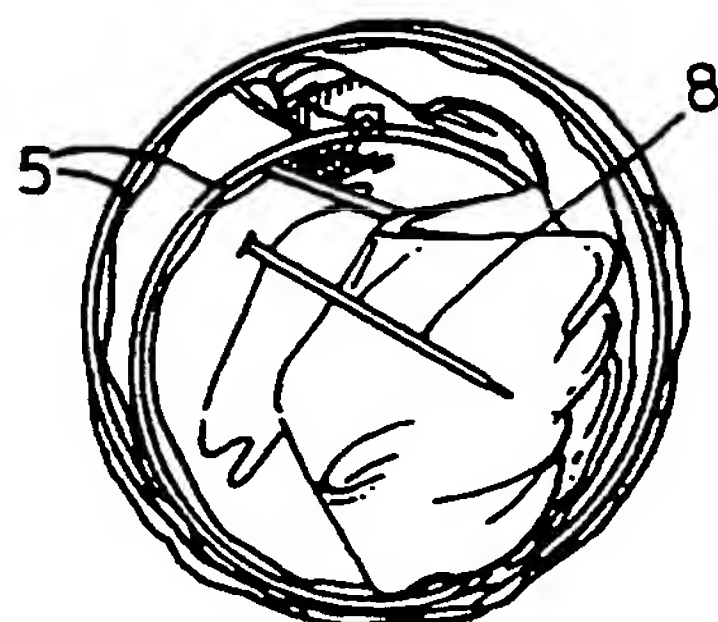


Fig.7.

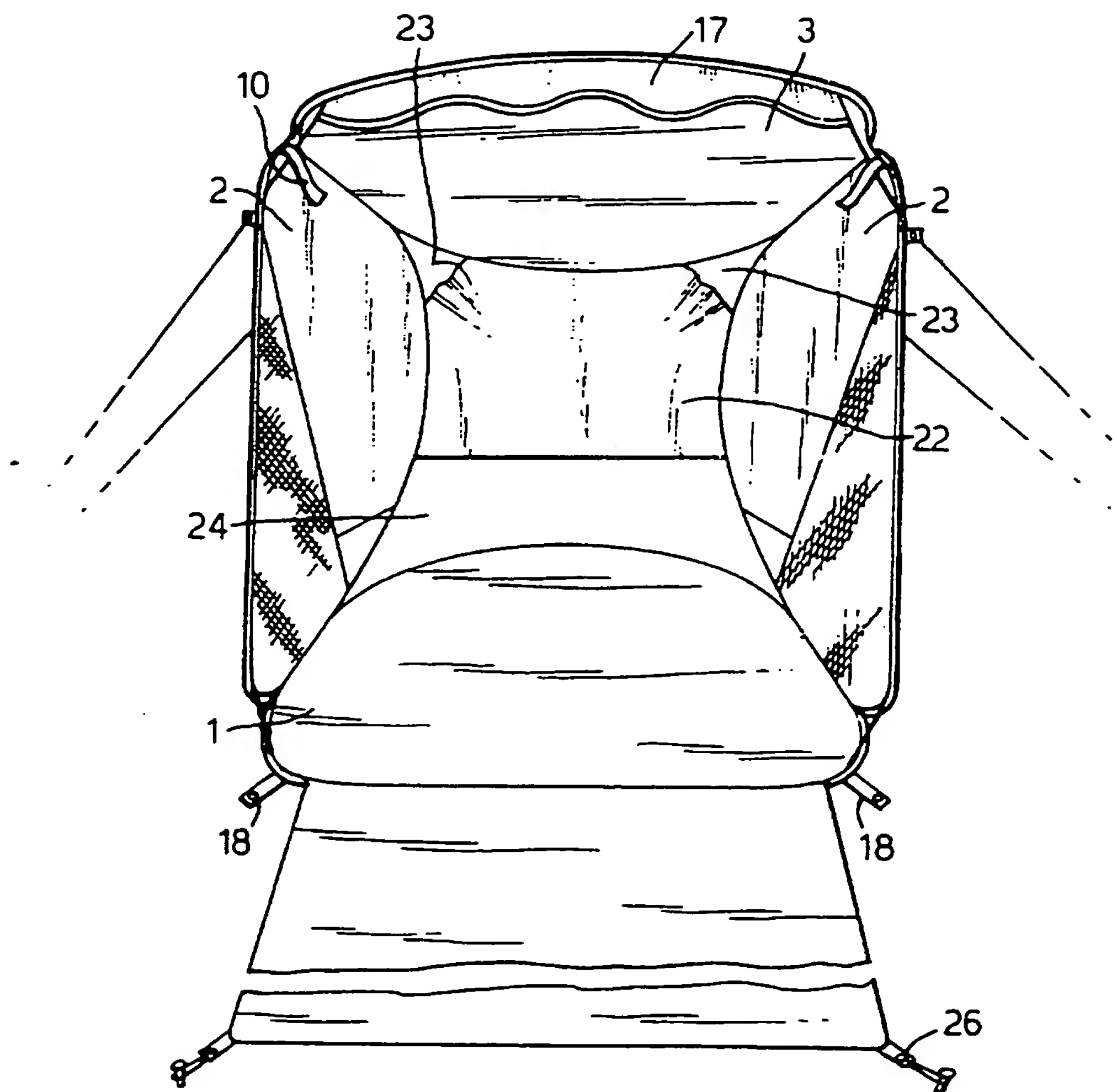


Fig.9.

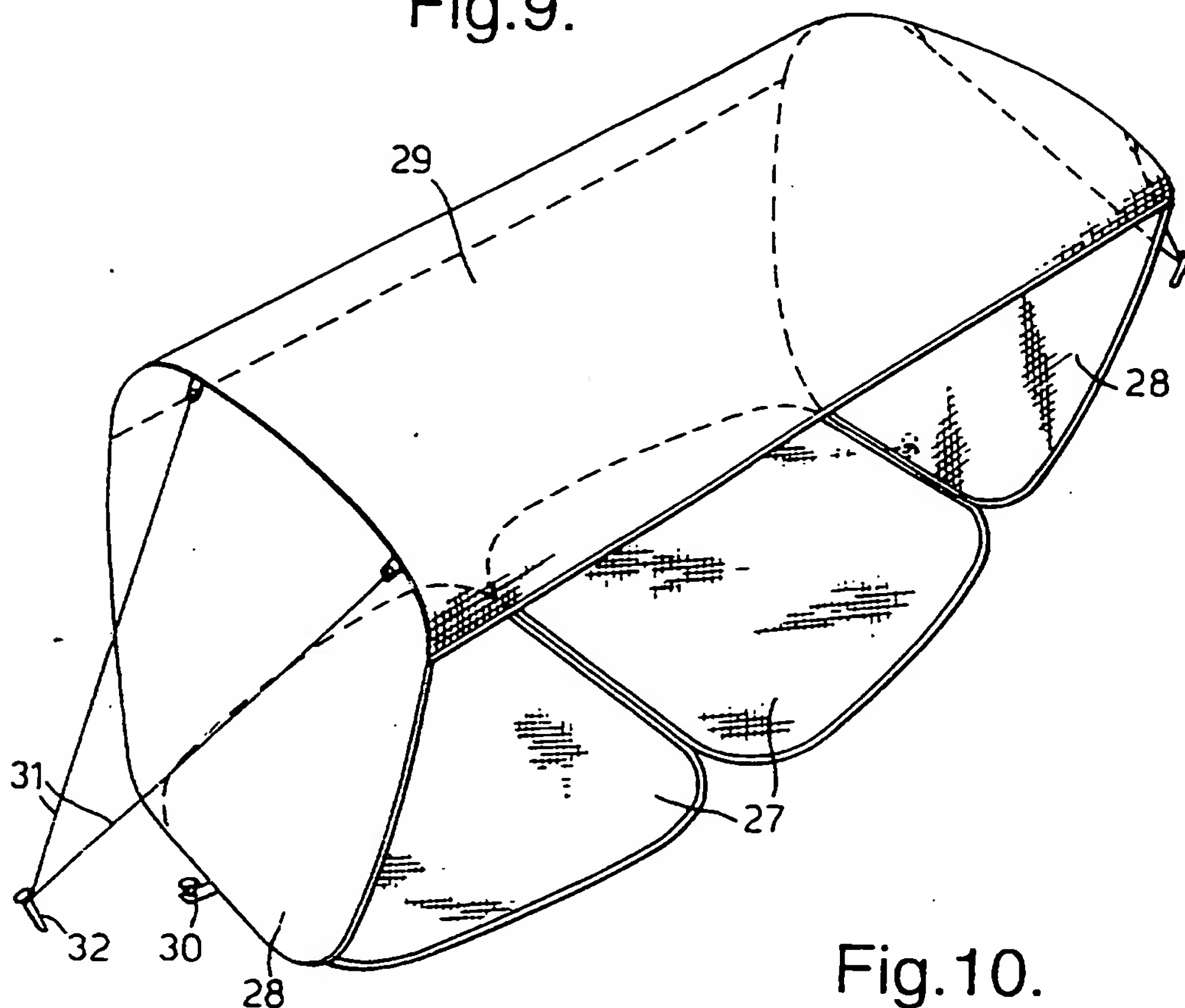
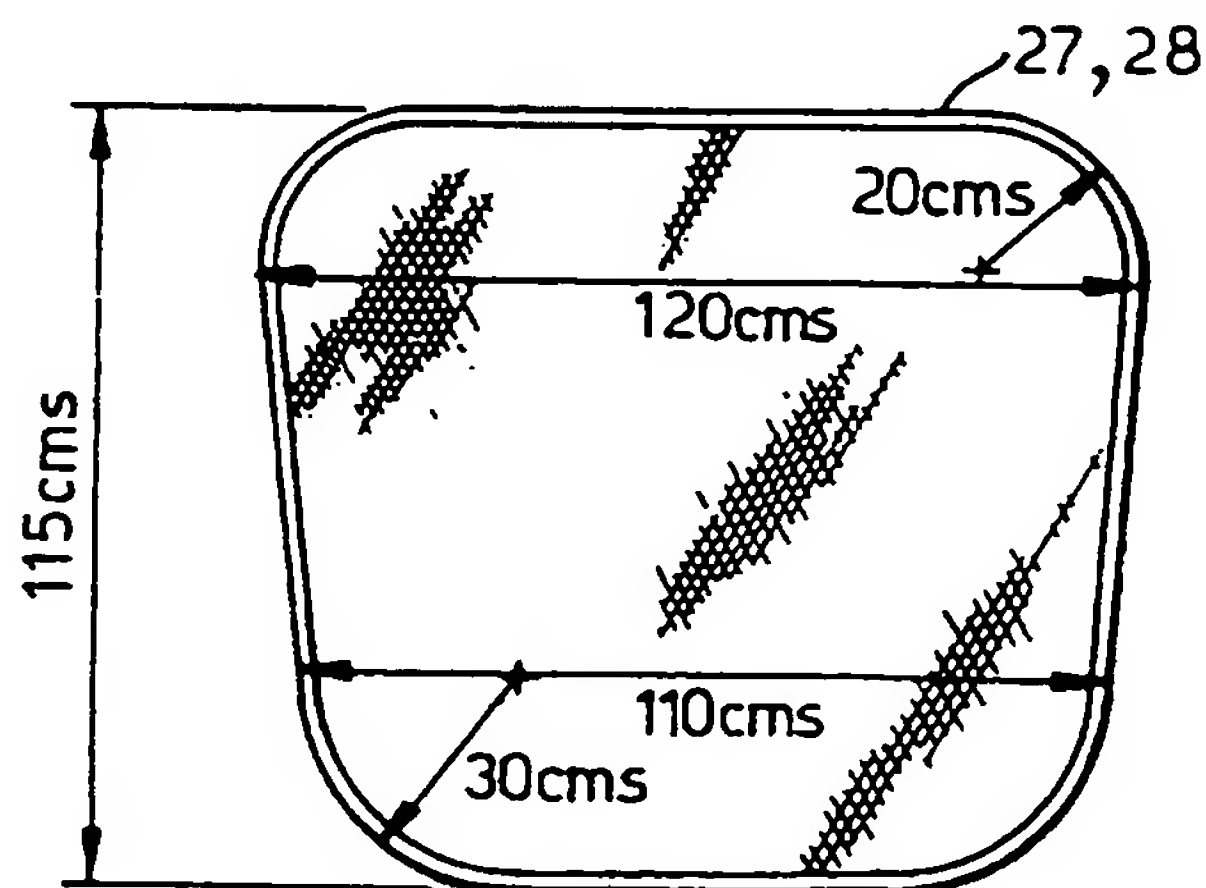


Fig.10.



INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 96/02458

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 E04H15/40 E04H15/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A,5 301 705 (YU ZHENG) 12 April 1994 see column 3, line 10 - column 4, line 37 see column 5, line 48 - line 65; figures 1,3,12 ---	1,3,8, 12-17
A	DE,A,32 19 879 (SCHAEFER KONRAD) 1 December 1983 see page 8, paragraph 3 - page 9, paragraph 3; figures 1,3 ---	1,2,5,12
A	US,A,5 249 592 (C. SPRINGER) 5 October 1993 see column 2, line 31 - column 3, line 22; figures 1-3 --- -/--	1,3

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

10 January 1997

Date of mailing of the international search report

24.01.97

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INTERNATIONAL SEARCH REPORT

Int ional Application No

PCT/GB 96/02458

C(Continuation)-DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO,A,91 02870 (SPRING FORM INC) 7 March 1991 see page 10, line 25 - page 12, line 30 see page 14, line 7 - page 16, line 5; figures 1-6,9-19</p> <p>---</p>	1,8
A	<p>US,A,4 465 087 (R. FERGUSON) 14 August 1984 see figure 2</p> <p>-----</p>	10,11

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/GB 96/02458

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-5301705	12-04-94	US-A- 5467794	21-11-95
		US-A- 5560385	01-10-96
		US-A- 5579799	03-12-96

DE-A-3219879	01-12-83	NONE	

US-A-5249592	05-10-93	NONE	

WO-A-9102870	07-03-91	US-A- 5038812	13-08-91
		AU-B- 636915	13-05-93
		AU-A- 6408190	03-04-91
		CA-A,C 2065019	19-02-91
		EP-A- 0487642	03-06-92

US-A-4465087	14-08-84	NONE	

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